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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,441	07/07/2003	Jong Soo Ko	2013P095	7432

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EXAMINER

LEVKOVICH, NATALIA A

ART UNIT	PAPER NUMBER
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1743

DATE MAILED: 11/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

5

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/615,441	KO ET AL.	
	Examiner	Art Unit	
	Natalia Levkovich	1743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 September 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Response to Amendment and Arguments*

1. Applicant's amendments and remarks dated 09/19/2005 have been acknowledged by the Examiner and entered.
2. Claims 1 and 11 recite "...wherein a first fluid injected via one of the fluid inlet ports flows by natural capillary force, and a second fluid injected via another fluid inlet port is forced to flow by an external pump". The above-cited functional recitation has not been given patentable weight because it is narrative in form. In order to be given patentable weight, a functional recitation must be expressed as a "means" for performing the specified function, as set forth in 35 USC §112, 6-th paragraph, and must be supported by recitation in the claim of sufficient structure to warrant the presence of the functional language. *In re Fuller*, 1929 C.D. 172; 388 O.G. 279. Since the external pump is not positively claimed, it is not considered to be a part of the invention and is not accorded patentable weight.

Applicant repeatedly argues that Hui does not teach 2 fluid inlet ports and an external pump wherein one fluid flows by capillary force and the other flows by external pump. Examiner disagrees. Hui does teach 2 fluid inlet ports. Examiner notes that the external pump is not positively recited in the instant claims. However, Hui does teach such a pump. Examiner also notes that Applicant's statement that one fluid flows by capillary and the other is forced is a statement of intended use. Intended use is of no patentable moment in claims to the apparatus. However, it appears that Hui does teach

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such intended use in that control fluids are pumped and sample fluid flows by capillary.

Applicant's arguments filed on 09/19/2005 are not persuasive.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being unclear for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, as amended, still does not set forth structural cooperation between elements of sensing substrate and elements of channel substrate, therefore Claim 1 is indefinite.

Claims 2 recites 'the microfluidic device of claim 1, wherein the channel path is predetermined up to a site of designation ...' It is not clear from the claim what structural elements provide for the aforementioned functional effect.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-4 are rejected under 35 U.S.C. 102(b) as anticipated by Hui Liu et al. (US 20040007275).

Hui Liu discloses a microfluidic device comprising a fluidic cartridge ['channel substrate'- Ex.] and a printed circuit board / PCB ['sensing substrate'- Ex.] bonded together (Figures 1 and 2 correspondingly). As was discussed previously (see the appropriate paragraphs of the 02/23/2005 Office Action), the PCB includes connecting electrodes [['electrode interconnect' – Ex.], electrode pads and detection ['sensing' – Ex.] electrodes 220 (Figure 2) in fluid communication with inlet ports via connected elements of microfluidic circuit (Figure 1). A sample and reagents are initially pipetted into chamber 115 and chamber 110 [via inlets –not shown- Ex.]. The pump chamber 105 provides for controlled fluid flow ([0016]; Figure 1). In yet another embodiment schematically shown in Figure 13, the fluidic circuit includes channel 1115 connecting the chambers and having two inlet ports 1111 and 1116, two controlled fluids being pumped (see [0029]). While the "controlled fluids" are driven by pump, other fluids flow due to natural forces (gravitational force and capillary force) - see, for example, Claim 2, [0017], [0020], [0039].

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Hui Liu in view of Troian et al. (US 20020150683).

See the appropriate paragraphs of the 02/23/2005 Office Action.

10. Claims 10-14 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Hui Liu in view of Blackburn et al. (US 20030190608).

See the appropriate paragraphs of the 02/23/2005 Office Action.

11. Claims 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Hui Liu in view of Blackburn and further in view of Troian.

See the appropriate paragraphs of the 02/23/2005 Office Action.

### ***Response to Arguments***

12 Applicant's arguments filed on 09/19/2005 have been fully considered but they are not persuasive (see paragraph 6 of the instant Office Action).

**Conclusion**

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:


Weigl et al.(US 20030075101) – discloses the two major types of driving fluids in microfluidic devices;

Handique et al.(US 20030070677) – discloses the two major types of driving fluids in microfluidic devices used in combination and multiple inlets of a fluidic circuit.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Natalia Levkovich whose telephone number is 571-272-2462. The examiner can normally be reached on Mon-Fri, 8 a.m.-4p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jill Warden  
Supervisory Patent Examiner  
Technology Center 1700